

The Grouping of Roles in SNOMED Clinical Terms

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SNOMED CT® is a comprehensive concept-based health care terminology that resulted from merger of SNOMED RT® and CTV3. Concepts are semantically defined using hierarchical (is-a) relationships and attribute-value relationships (roles) with other concepts. Stated relationships are created manually by editors and then a description logic classifier is used to develop inferred relationships based on these stated relationships. Semantic definitions can be problematic when concepts contain multiple types of attributes and attribute-values. This poster describes the grouping together of roles for clearer expression of interrelated, defining characteristics of concepts.

Introduction: There are two types of concept definitions in SNOMED CT: *Stated* definitions are modeled and explicitly defined by editors. *Inferred* definitions are generated by a classifier which uses description logic to identify relationships (which may not be explicitly stated by an editor) for each concept. The concept, "Dermatitis," is shown below with its stated and inferred definitional relationships:

Stated definition	Inferred definition
Dermatitis	Dermatitis
Is-a Disease of skin	Is-a Disease of skin
Is-a Inflammatory disorder	Is-a Inflammatory disorder
	Finding-site: Skin structure
	Morphology: Inflammation

The classifier adds the relationships, "Associated morphology: Inflammation" and "Finding-site: Skin Structure," to the definition of "Dermatitis" based on the definitions of its parent concepts. "Dermatitis" will now subsume any disorders having these relationships. However, problems may arise with concepts having multiple attribute types and attribute values, which may not classify correctly because of the description logic used for generating inferred definitions. Consider the following definitions: Based solely on the logical definition, it is difficult to

Stated definition	Inferred definition
Removal of foreign body from brain with incision into brain	Removal of foreign body from brain with incision into brain
Is-a Incision of brain	Is-a Incision of brain
Is-a Removal of foreign body	Is-a Removal of foreign body
body	Procedure site: Brain
	Direct-morphology: Foreign body
	Method: Incision
	Method: Removal

discern if the intended meaning is (Incision of brain AND Removal of foreign body) or (Incision of foreign body AND Removal of brain). A clearer representation is needed for these attribute-value relationships to produce the correct inferred definitions. Role grouping, which is analogous to nested role-value pairs, is used in SNOMED CT to link interrelated defining characteristics and fully develop hierarchical relationships based on these characteristics.

Removal of foreign body from brain with incision into brain

Is-a Incision of brain

Is-a Removal of foreign body

Role group 1

Method: Incision

Procedure site: Brain

Role group 2

Method: Removal

Direct-morphology: Foreign body

For the SNOMED CT First Release, we grouped together interrelated defining attributes of disorder and procedure concepts. Our initial experiences have been encouraging.

Conclusion: Semantic definitions of concepts with multiple attribute-value relationships generated by DL can be unclear. The grouping of roles provides a mechanism for more explicit expression of these defining attributes. Our initial experience with role grouping is with SNOMED CT. Further experience and testing are needed to evaluate the impact of role grouping for generating definitions and relationships.

References

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